

Marilyn A. Rasco, Ph.D.
Assistant Biologist & Assistant
Professor of Biology
The University of Texas System Cancer Center
M.D. Anderson Hospital & Tumor Institute
6723 Bertner Avenue
Houston, Texas 77030

Hydrocarbon Metabolizing Enzymes and Lung Cancer.

Aryl hydrocarbon hydroxylase (AHH) is an inducible enzyme which is critical in converting polycyclic aromatic hydrocarbons to their carcinogenic forms. In experimental animals, high inducibility of the enzyme in the lung correlated with increased incidence of lung tumors in response to intratracheal instillation of aromatic hydrocarbon carcinogens. In humans, AHH has been measured in cultured lymphocytes, pulmonary alveolar macrophages, surgically-excised lung tissue and placenta. Initial studies by Kellermann et al. suggested a relationship between high inducibility of AHH in cultured lymphocytes and the occurrence of bronchogenic carcinoma. Other laboratories have had difficulty repeating this work, primarily due to variability in the lymphocyte culture system.

These investigators have attempted to define the sources of variation in lymphocyte AHH activities. Measurements on over 500 cancer patients and 1,000 normal donors indicate that bronchogenic carcinoma patients and oropharyngeal squamous cell carcinoma patients have higher AHH inducibility than the normal population. A case-control study on lymphocytes from 29 lung cancer patients and their spouses confirmed the higher AHH inducibility in the patients.

The researchers have two major goals for this work in the coming year: (1) to further define sources of variation in the lymphocyte culture system and develop appropriate controls; and (2) to identify the cause-and-effect relationship between high AHH inducibility and the occurrence of certain tumor types.

Activation Date: January 1, 1978

Current Grant Level: \$50,142.

1005025409

A-46A